REMARKS

Claims 1, 3, 4, 6, 7, 8-31, 38-46 are pending.

Claims 1 and 42 were amended to recite a T351 temper condition. Claims 1, 31 and 42 were amended to recite a 0.2 % Mn lower limit as supported by Claim 6.

Claims 21-23 were amended to recite the Cu upper limit of Claim 9 and Cu lower limit of Claim 10.

Claim 31 relegates Fe to an impurity and recites a 0.31 lower limit for Mn as supported by Alloy 4 in Table 1 of the present application and its priority document.

Claims 41 and 43 were amended to recite the amount (in weight %) of Mn is in a range of 0.40 to 0.45% and the amount of Fe is at most 0.6%. This raises a new issue because Heymes et al. requires $0<Mn-2Fe<0.2$ and the recited ranges of Claims 41 and 43 falls outside this required feature of Heymes et al. Thus, these claims cannot overlap the disclosure of Heymes et al. Moreover, amended Claims 41 and 43 are supported by the priority document because the lower limit is supported by the examples at page 11 of the priority document and the upper limit is that of Claim 3 of the priority document.

New Claim 44 recites Mn is in a range of 0.31 to 0.45% and the amount of Fe is at most 0.05%. The lower end of the Mn range is supported by Alloy 4 in Table 1 of the present application and its priority document. The upper amount of Fe is supported because Fe can be considered an impurity and page 8, paragraph [0087] of the application and page 8, last paragraph of the priority document indicates typically each impurity is limited to 0.05% maximum. This raises a new issue because Heymes et al. requires $0<Mn-2Fe<0.2$ and the recited ranges of Claim 44 falls outside this required feature of Heymes et al. Thus, the claim cannot overlap the disclosure of Heymes et al.

New Claim 45 recites features from Claim 26 plus a stretching range from page 9 of the present application and page 10 of the priority document.

New Claim 46 recites the Cu upper limit of Claim 9 and the Cu lower limit of Claim 10.

It is respectfully submitted no new matter is presented by these claims.

I. 35 USC § 102

Claims 1, 3, 4, 6-8, 11-31, and 38-43 stand rejected under 35 USC § 102(e) as allegedly being anticipated by U.S. Publication No. 2004/0060618.

Applicants respectfully submit there is insufficient overlap for anticipation. For example, the broad Cu range of the reference is 4.5-5.5. In contrast, the broad Cu range of Claim 1 is 3.8 - 4.7.

Applicant, while not waiving any arguments regarding their other claims, respectfully submits Claim 41 and 43 were incorrectly rejected. The Final Office action asserted the following were not clearly supported by the priority document: a) T39 temper of independent Claims 1, 26 and 42, b) substantially Ag free alloy of Claim 19, and c) grain aspect ratios of Claims 21-23. Claim 41 and 43 did not recite these features. They recited T351 temper which is clearly supported by the priority document, i.e., EP 0278443.5, has a filing date of August 20, 2002, which antedates the reference. Thus, the reference is not prior art against them.

Accordingly, Claim 1 was combined with Claim 41; and Claim 42 was combined with Claim 43. Claims 1, 26 and 42 no longer recite T39 temper. Independent Claim 31 is supported by the priority document as explained below.

All the other claims depend from claims against which US '618, having a filing date of August 13, 2003 is not prior art. Thus, the rejection against them is moot.

Moreover, Applicants provide an additional argument below as to why the Ag free feature of Claim 19 is supported by the priority document.

Claims 21-23 were amended to recite a Cu range outside the reference, thus the rejection against them is moot.

Claim 1 is supported as follows, wherein page numbers refer to the certified copy of the priority document filed September 26, 2003:

Present Claim 1 (amendments shown with underlining and striking out)	Support from EP0278443.5 Claim 1	Support elsewhere in EP027844.3
A high damage tolerant Al-Cu 2xxx-series alloy rolled product having a high toughness and an improved fatigue crack growth resistance, comprising the following composition (in weight percent):	High damage tolerant Al-Cu alloy having a high toughness and an improved fatigue crack growth resistance, comprising essentially the following composition (in weight percent):	Page 1, first paragraph states. "More specifically, the present invention relates to a high damage tolerant Al-Cu-Mg alloy designated by the Aluminum Association ("AA") 2xxx-series...."
Cu: 3.8 - 4.7	Cu: 3.8 - 4.7	
Mg: 1.0 - 1.6	Mg: 1.0 - 1.6	
Zr: 0.06 - 0.18	Zr: 0.06 - 0.18	
Mn: > 0.2 - 0.45	Mn: >0 - 0.50, preferably >0.15	upper limit supported by claim 3; lower limit supported by page 7, first paragraph
Cr < 0.15		Page 7, last paragraph Cr+Zr ≤0.20% or Cr+Zr 0.05 to 0.15% coupled with page 11, Table 1, Alloy 8 having 0% Zr.
Fe: ≤ 0.15	Fe: ≤ 0.15	
Si: ≤ 0.15	Si: ≤ 0.15	
the balance essentially aluminum and incidental elements and impurities, wherein the alloy product comprises Mn-containing dispersoids and Zr-containing dispersoids, and	and Mn-containing dispersoids, the balance essentially aluminum and incidental elements and impurities, wherein the Mn-containing dispersoids are at least partially replaced by Zr-containing dispersoids.	
wherein the alloy product is in a T351 temper.		Page 11 discloses examples in the T351 temper.

Support in the priority document for present claims 1, 3, 4, 6-31 is detailed in the following table:

Present Claim No.	Support Location in Priority Document
1	See above Table 1
3	Claim 2
4	Page 8, last paragraph
7	Page 7, first paragraph
8	lower limit, page 7, second paragraph; upper limit Claim 1
9	Claim 4
10	Claim 4
11	Claim 5
12	Claim 5
13	Page 8
14	Page 8
15	Claim 6
16	Page 7, last paragraph showing Zr+Cr is in a range of 0.05 to 0.15% coupled with page 11, Table 1, Alloy 8 having 0% Zr.
17	Page 7, last paragraph
18	Page 7, last paragraph
19	Page 9, first paragraph indicates Ag is optional. This implies alloys may be made lacking Ag. Moreover, the Examples at page 11 show no silver.
20	Page 9, first paragraph
21	-
22	-
23	-
24	Page 5, second full paragraph and page 12 listing ASTM E-647
25	Page 5, second full paragraph and page 12 listing ASTM E-647
26	Claim 8; for tempers see above discussion of Claim 1
27	Page 10, lines 22-23
28	Page 10, lines 24-25
29	Page 10, lines 25-28
30	Page 10, lines 25-28
31	See above discussion of Claim 1, and impurity range of page 8, last paragraph of priority document and Mn of Alloy 4 in Table 1 of the priority document

Reconsideration is respectfully requested.

III. 35 USC § 103 - Heymes et al. in view of JP '574

Claims 1, 3, 4, 6-31 and 38-43 stand rejected under 35 USC § 103(a) as being unpatentable over Heymes et al. (U.S. Patent No. 6,077,363) in view of JP 07-252574 (JP '574). The Office Action asserts Heymes et al. teaches each feature of the rejected claims, except for the addition of Zr and/or Cr to the alloy, for which purpose JP '574 is cited.

Paragraph [0004] of JP '574 states that the Fe and Si-content ranges of 0.15% or less for Fe and 0.1% or less for Si results in aluminum metal with such very high purity that it, "becomes cost quantity, and is lacking in practicality".

Thus, JP '574 teaches away from the presently recited low Fe and Si ranges by presenting alloys outside the presently recited ranges, in combination with processing steps including a cooling rate during casting (see paragraph [0017]). This cooling rate effect occurs when Fe+Si>0.4% (see, e.g., Fig. 1 and paragraph [0007]).

Furthermore, one of ordinary skill in the art would not look to JP '574 when attempting to increase the strength and toughness of the Heymes et al. aluminum alloy product, as JP '574 teaches the possible addition of Mn and/or Zr and/or Cr only in combination with high levels of Fe and Si.

In contrast, the present specification shows that low levels of Fe and Si (each less than 0.15%), in combination with Mn (>0.15-0.45%) and Zr (0.16-0.18%), not only works, but achieves significant advantages over prior art alloys.

The selection of the presently recited ranges provides unexpected improvement in fatigue crack growth rate. Applicants direct the Examiner's attention to paragraph nos. 65, 108 and 109, as well as to Table 3 of the present application. These sections show the unexpected improvement over a conventional AA2024 alloy (wherein the Mn and Zr values are not within the presently recited ranges). The data shows unexpected improvement when the Mn and Zr levels are selected such that Mn is between 0.21 and 0.43%, while simultaneously, Zr is between 0.06 and 0.14. It is respectfully submitted this data is commensurate in scope with the present claims for T351 alloy. The Mn level of the independent claims has been amended to be more commensurate with the data in the application.

The Final Office action asserts it is not clear that alloy 2024 is the closest art. Applicant replies it is for the following reasons. The following table presents AA2024 and 2054 and Alloys 1-7 from Table 1 of the application, the claimed range of present Claim 1, and the closest alloy of Heymes et al. (Alloy A4). Heymes et al. Alloy A3 is essentially the tested AA 2524 but for a slightly higher % Cu.

Chemical composition of the DC-cast aluminum alloys, in weight %, balance aluminum and inevitable impurities.							
Alloy	Alloying Element						
	Cu	Mn	Mg	Zr	Cr	Si	Fe
AA2024	4.4	0.59	1.5	0	0	about 0.05%	about 0.06%
AA2524	4.3	0.51	1.4	0	0	about 0.05%	about 0.06%
1	4.4	0.40	1.3	0.06	0	about 0.05%	about 0.06%
2	4.3	0.41	1.3	0.09	0	about 0.05%	about 0.06%
3	4.2	0.43	1.2	0.14	0	about 0.05%	about 0.06%
4	4.1	0.31	1.2	0.14	0	about 0.05%	about 0.06%
5	4.1	0.21	1.2	0.14	0	about 0.05%	about 0.06%
6	4.4	0.21	1.4	0.10	0	about 0.05%	about 0.06%
7	4.4	0.21	1.3	0	0.08	about 0.05%	about 0.06%
Present Claim 1	3.8 - 4.7	0.2 - 0.45	1.0 - 1.6	0.06 - 0.18	< 0.15	≤ 0.15	≤ 0.15
Heymes et al. A4**	4.32	0.37	1.29	0.001	0.005	0.08	0.15
* A4 also contains 0.02% Ti and 0.05% Zn							

It is respectfully submitted that Heymes et al. Alloy A4 is sufficiently close to AA2524 that the comparison of the invention examples with AA2524 indicates a comparison with Heymes et al. Alloy A4.

Table 3 from the application compares fatigue crack growth rate with ΔK-level is MPa√m for all alloys compared with commercially available AA2024 alloy (= baseline) and shows the advantages of the present invention over AA2524.

Table 3. Fatigue crack growth rate with ΔK-level is MPa√m for all alloys compared with commercially available AA2024 alloy (= baseline).

Alloy	Cycles between a=5 and 20mm	Improvement in lifetime over AA2024
AA2024	163830	baseline
AA2524	216598	32%
1	338468	107%
3	526866	222%
5	416750	154%
6	272034	66%
7	284609	74%

As mentioned above, Claims 41 and 43 recite the amount (in weight %) of Mn is in a range of 0.40 to 0.45% and the amount of Fe is at most 0.6%. Also, amended CLaim 31 and new Claim 44 recite Mn is in a range of 0.31 to 0.45% and the amount of Fe is at most 0.05%. These claims further distinguish over Heymes et al. because Heymes et al. requires $0<Mn-2Fe<0.2$ and the recited ranges of these claims fall outside this required feature of Heymes et al. Thus, Heymes et al. teaches away from these claims and these claims do not overlap the disclosure of Heymes et al.

IV. Provisional Double Patenting

Applicants shall file any necessary Terminal Disclaimers when required in response to the rejections under the judicially created doctrine of obvious-type double patenting.

V. Conclusion

In view of the above, it is respectfully submitted that all objections and rejections are overcome. Thus, a Notice of Allowance is respectfully requested.

Respectfully submitted,

Date: Feb. 8, 2006

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